Station-to-archive file format description 2013-09

To avoid conflicts with already submitted files in the ftp archive, the format of the station-to-archive file was changed only insignificantly with respect to the pervious Technical Plan for BSRN Data Management from Hegner et al., 1998 (http://hdl.handle.net/10013/epic.39581.d001). Only minor inconsistencies have been corrected. From the logical record 1300 all information concerning spectral aerosol optical depth has been excluded since it has never been used before. The logical records 4000 and 4nnn were added in order to archive also pyrgeometer temperatures at ground level and nnn meters height above ground.

A single station-to-archive file contains all data from one month and one station. All files are named *stammyy.dat* with *sta* = station abbreviation, see Table 2 but written in small letters, *mm* = month (01-12) and *yy* = year (last two numbers). All station-to-archive files are ASCII coded, see Table 1. The length of the lines in the files is less than or equal to 80 characters. The end-of-line character of the files is LF.

The lines in the file are grouped in logical records. The logical records are headed by a line beginning with *C9999 or *U9999, where 9999 is the logical record number. The second character of the logical record header line is C if data in the logical record has been changed compared to the previous month, U if there are no changes. For the metadata logical record numbers below 99 are used, for the atmospheric data the logical record 100 is obligatory. All optional logical records carry higher numbers. General messages and information not to be inserted in the BSRN database are given in the logical record 3.

The identification numbers of the quantities measured, of the topography and the surface types, of the stations, and the pyrgeometer compensation codes are given in Tables 2 – 7. The identification numbers of the radiation instruments are assigned by the WRMC. For new numbers please contact the WRMC (http://www.bsrn.awi.de/). The numbers are unique in the BSRN.

The first line of most metadata logical records and of the instrument sub-records contains the date when any change as compared to the previous accumulation period occurred. This date is the start of the period, for which the values given in the following fields of the record apply. The missing value code (-1) indicating that no change occurred is mandatory if the logical record is flagged as unchanged in the record header line.

The file format also contains flags indicating whether the SYNOP, and special surface observations of the extended measurement program (see Table 1, logical record 0007) are operated. There is also an operated/not operated flag for every radiation instrument (see Table 1, logical record 0008, line 1). These flags are used for recording gaps in the measurement and/or changes of the instruments.

Table 1. BSRN station-to-archive file format. All logical records are compulsory definitions. The file is identified by the station id no., the year and the month in logical record 0001. The dates of change in logical records 0002, 0004, 0005, 0006, 0007, 0008, and 0009 are given by day, hour, and minute with ranges 1... 31, 0... 23, and 0... 59. The dates of measurement in logical records 0100, 0200, ... are given by day and minute with ranges 1... 31 and 0... 1439 also for quantities measured in hour intervals

Logical record	Line no.	Description of field / format of line	Range of values	Missing code	Format
0001	1	station identification number http://www.bsrn.awi.de/en/stations/listings/	1 - 99		I2
	1	month of measurement	1 - 12		I2
	1	year of measurement	>= 1992		I4
	1	version of data	1 - 99		I2
	1	(X,I2,X,I2,X,I4,X,I2)			
	2	id. no. of 1st, 2nd, ... quantity measured	Table 3		I9
	et seq.	(8(X,I9)); missing values -1 to fill up line as many lines as needed	Table 3		
0002	1	date when scientist changed (day, hour, min.)	0 - 59	-1	3(X,I2)
scientist	2	name of station scientist			A38
	2	telephone no. of station scientist			A20
	3	FAX no. of station scientist			A20
	3	(A38,X,A20,X,A20)			
	3	TCP/IP no.		XXX	A15
	3	e-mail address		XXX	A50
	3	(A15,X,A50)			
	4	address of station scientists			(A80)
	5	date when deputy changed (day, hour, min.)	0 - 59	-1	3(X,I2)
	6	name of station deputy			A38
	6	Telephone no. of station deputy			A20
	6	FAX no. of station deputy			A20
	6	(A38,X,A20,X,A20)			
	7	TCP/IP no. of deputy		XXX	A15
	7	e-mail address of deputy		XXX	A50
	7	(A15,X,A50)			
	8	address of deputy			A80
0003	1	messages not to be inserted in		XXX	A80
	et seq.	the BSRN database		XXX	A80
0004	1	date when station description changed. (day, hour, min.)	0 - 59	-1	3(X,I2)
station	2	surface type	Table 4		I2
descr.	2	topography type	Table 5		I2
horizon	2	(X,I2,X,I2)			
	3	address (A80)			
	4	telephone no. of station		XXX	A20
	4	FAX no. of station		XXX	A20
	4	(A20,X,A20)			
	5	TCP/IP no. of station		XXX	A15
	5	e-mail address of station		XXX	A50
	5	(A15,XA50)			
	6	latitude [degrees, 0 is Southpole, positive is northward]	0 - 179		F7.3
	6	longitude [degrees, 0 is 180 W, positive is eastwards]	0 - 359		F7.3
	6	altitude [m above sea level]			I4
	6	identification of "SYNOP" station		XXXXX	A5
	6	(2(X,F7.3),X,I4,X,A5)			
	7	date when horizon changed. (day, hour, min.)	0 - 59	-1	3(X,I2)
	8	azimuth [degrees from north clockwise]	0 - 359	-1	I3
	et seq.	elevation [degrees] (11(X,I3,X,I2)); as many lines with 11 pairs to give horizon, last line filled up with -1	0 - 89	-1	I2

Table 1. BSRN station-to-archive file format continued.

Logical record	Line no.	Description of field / format of line	Range of values	Missing code	Format of v./l.
0005	1	date when change occurred (day, hour, min.)	0 - 59	-1	3(X,I2)
radiosonde	1	is radiosonde operating?	Y, N		Al
equipment	1	(3(X,I2),X,A1)			
	2	manufacturer			A30
	2	location			A25
	2	distance from radiation site [km]			I3
	2	time of 1st launch [h UTC]	0 - 23	-1	I2
	2	time of 2nd launch [h UTC]	0 - 23	-1	I2
	2	time of 3rd launch [h UTC]	0 - 23	-1	I2
	2	time of 4th launch [h UTC]	0 - 23	-1	I2
	2	identification of radiosonde			A5
	2	(A30,X,A25,X,I3,4(X,I2),X,A5)			
	3	remarks about radiosonde		XXX	A80
0006	1	date when change occurred (day, hour, min.)	0 - 59	-1	3(X,I2)
ozone m.	1	are ozone measurements operated?	Y, N		Al
equipment	1	(3(X,I2),X,A1)			
	2	manufacturer			A30
	2	location			A25
	2	distance from radiation site [km]			I3
	2	identification number of ozone instrument			A5
	2	(A30,X,A25,X,I3,X,I5)			
	3	remarks about ozone measurements		XXX	A80
0007	1	date when change occurred (day, hour, min.)	0 - 59	-1	3(X,I2)
station	2	method est. cloud amount (digital proc.)		XXX	A80
history	3	method est. cloud base height (with instrument)		XXX	A80
	4	method est. cloud liquid water content		XXX	A80
	5	method est. cloud aerosol vertical distribution		XXX	A80
	6	method est. water vapour press. v.d. (A80)		XXX	A80
	7	6 flags indicating if the SYNOP and/or the corresponding quantities of the expanded programme, are measured	Y, N		Al
	7	(A1,X,A1,X,A1,X,A1,X,A1,X,A1)			
0008	1	date when change occurred (day, hour, min.)	0 - 59	-1	3(X,I2)
radiation	1	is instrument measuring	Y, N		Al
instruments	1	(3(X,I2),X,A1)			
	2	manufacturer			A30
	2	model			A15
	2	serial number			A18
	2	date of purchase [MM/DD/YY]		XXX	A8
	2	identification number assigned by the WRMC			I5
	2	(A30,X,A15,X,A18,X,A8,X,I5)			
	3	remarks about the radiation istrument		XXX	A80
	4	pyrgeometer body compensation code	Table 6	-1	I2
	4	pyrgeometer dome compensation code	Table 7	-1	Î2
	4	wavelength of band 1of spectral i. [micron]		-1.000	F7.3
	4	bandwidth of band 1of spectral i. [micron]		-1.000	F7.3
	4	wavelength of band 2		-1.000	F7.3
	4	bandwidth of band 2		-1.000	F7.3
	4	wavelength of band 3		-1.000	F7.3
	4	bandwidth of band 3		-1.000	F7.3
	4	max. ┐ zenith angle [degree] of direct	0 - 90	-1	I2
	4	min. ┘ (spectral) instrument	0 - 90	-1	I2
	4	(2(X,I2),6(X,F7.3),2(X,I2))			
	5	location of calibration			A30
	5	person doing calibration			A40
	5	(A30,X,A40)			

Table 1. BSRN station-to-archive file format continued.

Logical record	Line no.	Description of field / format of line	Range values	Missing code	Format of v./l.
	6	start of calibration period (band 1 of spectr. instr.)			A8
	6	end of ... (both [MM/DD/YY])			A8
	6	number of comparisons (band 1 of spectr. instr.)		-1	I2
	6	mean calibration coefficient (band 1 of spectr. instr.)			F12.4
	6	standard error of cal. coeff. (band 1 of spectr. instr.)		-1.0000	F12.4
	6	(A8,X,A8,X,I2,2(X,F12.4))			
	7	start of calibration period band 2 of spectr. instr.		XXX	A8
	7	end of ... (both [MM/DD/YY])		XXX	A8
	7	number of comparisons band 2 of spectr. instr.		-1	I2
	7	mean calibration coefficient band 2 of spectr. instr.		-1.0000	F12.4
	7	standard error of cal. coeff. band 2 of spectr. instr.		-1.0000	F12.4
	7	(A8,X,A8,X,I2,2(X,F12.4))			
	8	start of calibration period band 3 of spectr. instr.		XXX	A8
	8	end of ... (both [MM/DD/YY])		XXX	A8
	8	number of comparisons band 3 of spectr. instr.		-1	I2
	8	mean calibration coefficient band 3 of spectr. instr.		-1.0000	F12.4
	8	standard error of cal. coeff. band 3 of spectr. instr		-1.0000	F12.4
	8	(A8,X,A8,X,I2,2(X,F12.4))			
	9	remarks on calibration, e.g. units of cal. coeff.		XXX	A80
	10	remarks on calibration (continued)		XXX	A80
	11	date when change occurred	0 - 59	-1	3(X,I2)
	11	…			
		Every radiation instr. at the station is described by 10 lines in the format given above (radiation subrecord)			
0009 assignment of radiation quantities to instruments	1	date when change occurred (day, hour, min.)	0 - 59	-1	3(X,I2)
	1	id. no. of radiation quantity measured			I9
	1	id. no. of instrument which measured quantity			I5
	1	no. of band (for spectral instruments)		-1	I2
	1	(3(X,I2),X,I9,X,I5,X,I2)			
	2	date when change occurred (day, hour, min.)	0 - 59	-1	I2
	2	as many lines to list all quantities together with the instruments; e.g.,			

```
 1  0  0        101   21013  1
 1  0  0        102   21013  2.
 1  0  0        103   21013  3
 1  0  0          3   21005 -1
 1  0  0          4   21006 -1
15  0  0          3   21007 -1
```

The above lines mean that (i) the short-wave spectral fluxes at bands 1, 2 and 3 are measured with instrument 21013, bands 1, 2, 3, (ii) the direct radiation is measured with instrument 21005 from the 1st day of the month until the 14th day of the month, with instrument 21007 since the 15th day of the month, and (iii) the diffuse radiation is measured with instrument 21006. Legal quantity id. nos. are listed in Tab 3, legal instrument id. nos. are assigned to the instruments at the BSRN stations by the WRMC. If an instrument measures more than one quantity, lines with the same instrument id. no. and the same date, but with different quantity id. nos. are repeated. However, repeating lines with the same date and the same quantity id. no. is not allowed.

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< 1  0  0          1   21005 -1      not   allowed  >
< 1  0  0          1   21006 -1      not   allowed  >
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Table 1. BSRN station-to-archive file format continued.

Logical record	Line no.	Description of field / format of line	Range of values	Missing code	Format of v./l.
0100	1	date [day]	1 - 31		I2
basic	1	time [minute]	0 - 1439		I4
meas.	1	global 2 (mean, std. dev., min., max.: columns 12 - 31)		-999 or	I4 or
	1	direct (mean, std. dev., min., max.: columns 35 - 54)		-99.9	F5.1
	2	diffuse (mean, std. dev., min., max.: columns 12-31)			
	2	downward long-wave radiation			
		(mean, std. dev., min., max.: columns 35 - 54)			
	2	air temperature at downward long-wave instrument height		-99.9	F5.1
	2	relative humidity at downward long-wave instrument height		-99.9	F5.1
	2	pressure at downward long-wave instrument height		-999	I4
		(X,I2,X,I4,2(3X,I4,X,F5.1,X,I4,X,I4),/			
		8X,2(3X,I4,X,F5.1,X,I4,X,I4),4X,F5.1,X,F5.1,X,I4)			
	3	date [day]	1 - 31		I2
	3	…			
		2 lines for each time measured			
0200	1	date [day]	1 - 31		I2
expanded	1	time [minute]	0 - 1439		I4
measurem.	1	downward short-wave spectr. at wavel. 1		-999 or	I4 or
	1	(mean, std. dev., min., max.: columns 12 - 31)		-99.9	F5.1
	1	...at wavel. 2 (mean, std. dev., min., max.: col. 35 - 54)			
	1	...at wavel. 3 (mean, std. dev., min., max.: col. 58 - 77)			
		(X,I2,X,I4,3(3X,I4,X,F5.1,X,I4,X,I4))			
	2	…			
		1 line for each time measured			
0300	1	date [day]	1 - 31		I2
other	1	time [minute]	0 - 1439		I4
measurem.	1	upward short-wave reflected		-999 or	I4 or
in		(mean, std. dev., min., max.: columns 12 - 31)		-99.9	F5.1
minutes	1	upward long-wave			
intervals		(mean, std. dev., min., max.: columns 35 - 54)			
	1	net radiation (net radiometer)			
		(mean, std. dev., min., max.: columns 58 - 77)			
	1	(X,I2,X,I4,3(3X,I4,X,F5.1,X,I4,X,I4)			
	2				
		…			
		1 line for each time measured			
0400	1	date [day]	1 - 31		I2
special	1	time [minute]	0 - 1439		I4
spectral	1	downward short-wave spectr. at wavel. 4		-999 or	I4 or
measurem.	1	(mean, std. dev., min., max.: columns 12 - 31)		-99.9	F5.1
	1	...at wavel. 5 (mean, std. dev., min., max.: col. 35 - 54)			
	1	...at wavel. 6 (mean, std. dev., min., max.: col. 58 - 77)			
	2	...at wavel. 7 (mean, std. dev., min., max.: col. 12 - 31)			
	2	...at wavel. 8 (mean, std. dev., min., max.: col. 35 - 54)			
	2	...at wavel. 9 (mean, std. dev., min., max.: col. 58 - 77)			
	3	...at wavel. 10 (mean, std. dev., min., max.: col. 12 - 31)			
	3	...at wavel. 11 (mean, std. dev., min., max.: col. 35 - 54)			
	3	...at wavel. 12 (mean, std. dev., min., max.: col. 58 - 77)			
		(X,I2,X,I4,3(3X,I4,X,F5.1,X,I4,X,I4)/			
		2(8X,3(3X,I4,X,F5.1,X,I4,X,I4)/))			
	4	…			
		3 lines for each time measured			

Table 1. BSRN station-to-archive file format continued.

Logical record	Line no.	Description of field / format of line	Range of values	Missing code	Format of v./l.
0500	1	date [day]	1 - 31		I2
ultra-violet	1	time [minute]	0 - 1439		I4
measurem.	1	uv-a global (mean, std. dev., min., max.: columns 10 - 32)		-99.9	F5.1
	1	uv-b direct (mean, std. dev., min., max.: columns 34 - 56)			
	2	uv-b global (mean, std. dev., min., max.: columns 10 - 32)			
	2	uv-b diffuse (mean, std. dev., min., max.: columns 34 - 56)			
	2	uv-b-reflected (mean, std. dev., min., max.: columns 58 - 80) (X,I2,X,I4,4(X,F5.1),4(X,F5.1),/ 8X,4(X,F5.1),4(X,F5.1),4(X,F5.1)			
	3	date [day]	1 - 31		I2
	3	… 2 lines for each time measured			
1000	1	YYGG9 IIiii Nddff 1SnTTT 2SnTdTdTd 3P0P0P0			<A80
surface		4PPPP 7wwWlWl 8NhClCmCh			

SYNOP		333 8NsChshsh 8NsChshsh 8NsChshsh
		as many lines as needed in format (A80)
		The code is part of FM 12–XII Ext. SYNOP report of surface observation from a fixed land station. NsChshsh can be coded up to 3 times. All other groups are compulsory.
		…
		Example:
		`01039 10393 82407 10091 20076 30018 40144 71000 80006 333 85273`
		`01049 10393 82506 10088 20077 30018 40144 7//// 80007`
		
		Alternative codes are welcome but stored only as ACSII-strings.			

1100	1	date [day]	1 - 31		I2
radiosonde	1	time [minute]	0 - 1439		I4
measurem.	1	level number (first level = 1)	1 - 9999		I4
in launch	1	pressure at level		-999	I4
intervals	1	height at level			I5
	1	temperature		-99.9	F5.1
	1	dew point		-999.9	F6.1
	1	wind direction, azimuth	0 - 359	-99	I3
	1	wind speed		-99	I3
	1	ozone concentration		-9.9	F4.1
	1	(X,I2,X,I4,3X,I4,X,I4,X,I5,X,F5.1,X,F6.1,X,I3,X,I3,X,F4.1)			
	2	date [day]	1 - 31		I2
	2	… 1 line for each level measured			
1200	1	date [day]	1 - 31		I2
ozone	1	time [minute]	0 - 1439		I4
measurem.	1	total ozone amount		-999	I4
in hours	1	(X,I2,X,I4,3X,I4)			
intervals	2	date [day]	1-31		I2
	2	… 1 line for each time measured			
1300	1	date [day]	1 - 31		I2
expanded	1	time [minute]	0 - 1439		I4
measurem.	1	total cloud amount with instrument		-9	I2
in hours	1	cloud base height with instrument in m (no clouds 99999)		-9999	I5
intervals	1	cloud liquid water in mm		-99.9	F5.1
1st part	1	(X,I2,X,I4,3X,I2,X,I5,X,F5.1)		-	
	2	date [day]	1 - 31		I2
	2	… 1 line for each time measured			

Table 1. BSRN station-to-archive file format continued.

Logical record	Line no.	Description of field / format of line	Range of values	Missing code	Format of v./l.
1500	1	date [day]	1 - 31		I2
other	1	time [minute]	0 - 1439		I4
measurem.	1	thermal spectral at wavelength 1		-9	I4
in hours	1	thermal spectral at wavelength 2		-9	I4
intervals	1	thermal spectral at wavelength 3		-9	I4
	1	hemispheric solar spectral at wavelength 1		-9	I4
	1	hemispheric solar spectral at wavelength 2		-9	I4
	1	hemispheric solar spectral at wavelength 3		-9	I4
	1	(X,I2,X,I4,2(3X,I4,X,I4,X,I4))			
	2	…			
		1 line for each time measured			
		The following are two examples of logical records defined for the measurements at heights of 10 and 30m on the Payerne station tower. Such logical records, and the corresponding relations in the BSRN database, are defined according to the configuration of the instruments at the BSRN stations that perform measurements at heights other than the standard height, i.e., for BSRN stations with a tower. The formats of both records are approximately the same as the format for logical record 100; thus the software for writing the records to the station-to-archive file at Payerne and for reading and inserting the data in the BSRN database at the WRMC is more standardized.			
3010	1	date [day]	1 - 31		I2
other	1	time [minute]	0 - 1439		I4
measurem.	1	global 2 (mean, std. dev., min., max.: columns 12 - 31)		-999 or	I4 or
at	1	short-wave upward			
10m		(mean, std. dev., min., max.: columns 35 - 54)		-99.9	F5.1
	2	downward long-wave radiation			
		(mean, std. dev., min., max.: columns 12 - 31)			
	2	upward long-wave radiation			
		(mean, std. dev., min., max.: columns 35 - 54)			
	2	air temperature		-99.9	F5.1
	2	relative humidity		-99.9	F5.1
		(X,I2,X,I4,2(3X,I4,X,F5.1,X,I4,X,I4),/			
		8X,2(3X,I4,X,F5.1,X,I4,X,I4),4X,F5.1,X,F5.1)			
	3	date [day]	1 - 31		I2
	3	…			
		2 lines for each time measured			
3030	1	date [day]	1 - 31		I2
other	1	time [minute]	0 - 1439		I4
measurem.	1	global 2 (mean, std. dev., min., max.: columns 12 - 31)		-999 or	I4 or
at	1	short-wave upward			
30m		(mean, std. dev., min., max.: columns 35 - 54)		-99.9	F5.1
	2	downward long-wave radiation			
		(mean, std. dev., min., max.: columns 12 - 31)			
	2	upward long-wave radiation			
		(mean, std. dev., min., max.: columns 35 - 54)			
	2	air temperature		-99.9	F5.1
	2	relative humidity		-99.9	F5.1
		(X,I2,X,I4,2(3X,I4,X,F5.1,X,I4,X,I4),/			
		8X,2(3X,I4,X,F5.1,X,I4,X,I4),4X,F5.1,X,F5.1)			
	3	date [day]	1 - 31		I2
	3	…			
		2 lines for each time measured			

Table 1. BSRN station-to-archive file format continued.

Logical record	Line no.	Description of field / format of line	Range of values	Missing code	Format of v./l.
4000	1	date [day]	1 - 31		I2
pyrgeo.	1	time [minute]	0 - 1439		I4
temp.	1	dome temperature 1downward long-wave instrument [°C]		-99.9	F5.1
	1	dome temperature 2 downward long-wave instrument [°C]		-99.9	F5.1
	1	dome temperature 3 downward long-wave instrument [°C]		-99.9	F5.1
	1	body temperature downward long-wave instrument [°C]		-99.9	F5.1
	1	thermopile output downward long-wave instrument [W/m^2]		-999	I4
	1	dome temperature 1upward long-wave instrument [°C]		-99.9	F5.1
	1	dome temperature 2 upward long-wave instrument [°C]		-99.9	F5.1
	1	dome temperature 3 upward long-wave instrument [°C]		-99.9	F5.1
	1	body temperature upward long-wave instrument [°C]		-99.9	F5.1
	1	thermopile output upward long-wave instrument [W/m^2]		-999	I4
		(X,I2,X,I4,4(F5.1,X),I4,3X, 4(F5.1,X),I4			
4nnn pyrgeo. temp. at nnn meter		pyrgeometer temperatures from instruments mounted on towers at a height of nnn meters are coded according to the definitions for pyrgeometers at standard height (~ 2 meters) see LR 4000.			

Table 2. BSRN Stations. For more information see: http://www.bsrn.awi.de/en/stations/listings/.

Station abbreviation	Station name	Start date	Latitude	Longitude	Elevation [m]	Station identification number
ALE	Alert	01.08.2004	82.490	-64.420	127	18
ASP	Alice Springs	01.01.1995	-23.798	133.888	547	1
BAR	Barrow	01.01.1992	71.323	-156.607	8	22
BER	Bermuda	01.01.1992	32.267	-64.667	8	24
BIL	Billings	01.06.1993	36.605	-97.516	317	28
BON	Bondville	01.01.1995	40.066	-88.366	213	32
BOS	Boulder	01.07.1995	40.125	-105.237	1689	34
BOU	Boulder	01.01.1992	40.05	-105.007	1577	23
BRB	Brasilia	01.02.2006	-15.601	-47.713	1023	71
BUD	Budapest		47.429	19.182	139	Candidate, 14
CAB	Cabauw	01.12.2005	51.971	4.926		53
CAM	Camborne	01.01.2001	50.216	-5.316	88	50
CAR	Carpentras	01.08.1996	44.083	5.059	100	10
CLH	Chesapeake Light	01.06.2000	36.905	-75.713	37	39
CNR	Cener	01.07.2009	42.816	-1.601	471	45
COC	Cocos Island	14.09.2004	-12.193	96.835		47
DAA	De Aar	01.05.2000	-30.666	23.993	1287	40
DAR	Darwin	01.06.2002	-12.425	130.891	30	2
DOM	Concordia Station, Dome C	01.01.2006	-75.1	123.383	3233	74
DRA	Desert Rock	01.02.1998	36.626	-116.018	1007	35
DWN	Darwin Met Office		-12.424	130.892	32	Candidate, 65
EUR	Eureka	01.09-2007	79.989	-85.9405	85	19
E13	S. Great Plains	01.08.1997	36.605	-97.485	318	27
FLO	Florianopolis	01.06.1994	-27.533	-48.517	11	3
FPE	Fort Peck	01.01.1995	48.316	-105.1	634	31
FUA	Fukuoka	01.04.2010	33.581	130.375	3	6
GCR	Goodwin Creek	01.01.1995	34.25	-89.87	98	33
GOB	Gobabeb	05.15.2012	-23.5614	15.0420	407	20
GRS	Greenland Summit		72.566	-38.483		Candidate
GVN	Georg von Neumayer	01.01.1992	-70.65	-8.25	42	13
HAN	Hanimaadhoo		6.783	73.183		Candidate
ILO	Ilorin	01.08.1992	8.533	4.566	350	38
ISH	Ishigakijima	01.04.2010	24.336	124.163	5	7
IZA	Izaña	01.03.2009	28.309	-16.499	2372	61
JUN	Jungfraujoch		46.55	7.983		Candidate
KWA	Kwajalein	01.03.1992	8.72	167.731	10	25
LAU	Lauder	01.07.1998	-45.045	169.689	350	60
LER	Lerwick	01.01.2001	60.133	-1.183	84	51
LIN	Lindenberg	01.09.1994	52.21	14.122	125	12
MAN	Momote	01.09.1996	-2.058	147.425	6	29
MNM	Minamitorishima	01.04.2010	24.288	153.983	7	8
NAU	Nauru Island	01.11.1998	-0.521	166.916	7	30
NYA	Ny-Ålesund	01.08.1992	78.925	11.93	11	11
PAL	Palaiseau Cedex	01.05.2003	48.713	2.208	156	63
PAY	Payerne	01.09.1992	46.815	6.944	491	21
PSA	Plataforma Solar de Almeria		37.5	-2.2		Candidate
PSU	Rock Springs	01.05.1998	40.72	-77.933	376	36
PTR	Petrolina	01.12.2006	-9.068	-40.319	387	72
REG	Regina	01.01.1995	50.205	-104.713	578	5
RLM	Rolim de Moura	01.01.2007	-11.582	-61.773	252	73
SAP	Sapporo	01.04.2010	43.06	141.328	17	4
SBO	Sede Boqer	01.01.2003	30.905	34.782	500	43
SMS	São Martinho da Serra	01.01.2006	-29.442	-53.823	489	70
SOV	Solar Village	01.08.1998	24.91	46.41	650	41
SON	Sonnblick	01.01.2013	47.054	12.9577	3109	75
SPO	South Pole	01.01.1992	-89.983	-24.799	2800	26
SXF	Sioux Falls	01.06.2003	43.73	-96.62	473	37
SYO	Syowa	01.01.1994	-69.005	39.589	18	17
TAM	Tamanrasset	01.03.2000	22.78	5.51	1385	42
TAT	Tateno	01.02.1996	36.05	140.133	25	16
TIK	Tiksi	08.06.2010	71.586	128.918	48	48
TOR	Toravere	01.01.1999	58.254	26.462	70	9
XIA	Xianghe	01.01.2005	39.754	116.962	32	44
ZVE	Zvenigrod		55.695	36.775	180	Candidate, 46

Table 3. Quantity measured. Every radiation value is measured by exactly one radiation instrument. If a value in height is missing, the quantity is measured only once at standard height. The id. no. of instruments not measured at standard height consists of the id. no. measured at standard height followed by 6 numericals expressing the height of the instruments above ground in cm.

Id. number	Height in cm	Quantity measured	Unit	Format
2		global 2 (pyranometer)	Wm^{-2}	9999
3		direct	Wm^{-2}	9999
4		diffuse sky	Wm^{-2}	9999
5		long-wave downward	Wm^{-2}	9999
21		air temperature	°C	999.9
22		relative humidity	%	99.9
23		pressure	hPa	9999
121		uv-a-global	Wm^{-2}	9999
122		uv-b-direct	Wm^{-2}	9999
123		uv-b-global	Wm^{-2}	9999
124		uv-b-diffuse	Wm^{-2}	9999
125		uv-b-reflected	Wm^{-2}	9999
131		short-wave reflected	Wm^{-2}	9999
132		long-wave upward	Wm^{-2}	9999
141		net radiation (net radiometer)	Wm^{-2}	9999
2000700	700	global 2 (pyranometer)	Wm^{-2}	9999
131000700	700	short-wave reflected	Wm^{-2}	9999
132000700	700	long-wave upward	$Wm-^{2}$	9999
5000700	700	long-wave downward	Wm^{-2}	9999
21000700	700	air temperature	°C	999.9
22000700	700	relative humidity	%	99.9
131003000	3000	short-wave reflected	Wm^{-2}	9999
104		short-wave spec. bd. 1		99999
104		short-wave spec. bd. 1		99999
112		short-wave spec. bd. 3		99999
301		total cloud amount with instrument	%	99
302		cloud base height with instrument	m	9999
303		cloud liquid water	mm	999.9

Table 4. Types of surface.

Id. number	Surface type	
1	glacier	accumulation area
2	glacier	ablation area
3	iceshelf	-
4	sea ice	-
5	water	river
6	water	lake
7	water	ocean
8	desert	rock
9	desert	sand
10	desert	gravel
11	concrete	-
12	asphalt	-
13	cultivated	-
14	tundra	-
15	grass	-
16	shrub	-
17	forest	evergreen
18	forest	deciduous
19	forest	mixed
20	rock	-
21	sand	-

Table 5. Types of topography.

Id. number	Topography type		
1	flat		urban
2	flat		rural
3	hilly		urban
4	hilly		rural
5	mountain	top	urban
6	mountain	top	rural
7	mountain	valley	urban
8	mountain	valley	rural

Table 6. Pyrgeometer body temperature compensation codes.

Id. number	Body temperature compensation
1	Manufacturer´s battery circuit
2	Corrected manufacturer´s battery circuit
3	Temperature measurement with σT_c^4
4	Other

Table 7. Pyrgeometer dome temperature compensation codes.

Id. number	Dome temperature compensation
1	Dome shaded
2	Instrument ventilated
3	Temperature measurement with σT_c^4
4	shaded & ventilated
5	shaded & σT_c^4
6	ventilated & σT_c^4
7	shaded & ventilated & σT_c^4
8	Other